Blind Equalization And System Identification Batch Processing Algorithms Performance And Applicatio | 1515aeac7a47b2c669501049c71e55c8

Springer Handbook of Speech ProcessingAdvanced Wireless CommunicationsCommunications and NetworkingAdaptive Blind Signal and Image ProcessingCyclostationary Processes and Time SeriesBlind Equalization in Neural NetworksDigital Signal Processing Handbook on CD-ROMSignal Prediction with Input IdentificationSignal Prediction with Input IdentificationAdvanced Ultrawideband RadarAdvanced Signal ProcessingCMOS Continuous-Time Adaptive Equalizers for High-Speed Serial LinksA Novel Approach for Adaptive Signal ProcessingFourier TransformUnsupervised Signal ProcessingAlgorithms for Communications Systems and their ApplicationsCircuits and Systems for Wireless CommunicationsResonance and Aspect Matched Adaptive Radar (Ramar)Chaotic Signals in Digital CommunicationsSystem Identification (SYSID '03)Block-oriented Nonlinear System IdentificationDigital Signal Processing Systems: Implementation TechniquesSignal Processing for Wireless Communication SystemsSystem Identification 2003Efficient Receiver Methods for Coded Systems Under Channel UncertaintyBlind Identification of Structured Dynamic SystemsSimulation Technologies in Networking and CommunicationsBlind Equalization and System IdentificationDigital Signal Processing FundamentalsReview of Radio ScienceAdaptive FilteringDigital TransmissionNovel Algorithms and Techniques in Telecommunications and NetworkingChaotic Signal ProcessingLinear Algebra for Signal ProcessingNonlinear Signal and Image ProcessingBlind System Identification and Blind Equalization Using Higher-order CumulantsBlind Equalization and IdentificationFilter Bank Transceivers for OFDM and DMT SystemsTechniques for Blind System Identification and Application to the Equalization of PAM/QAM Modulated Signals

Springer Handbook of Speech Processing With solid theoretical foundations and numerous potential applications, Blind Signal Processing (BSP) is one of the hottest emerging areas in Signal Processing. This volume unifies and extends the theories of adaptive blind signal and image processing and provides practical and efficient algorithms for blind source separation: Independent, Principal, Minor Component Analysis, and Multichannel Blind Deconvolution (MBD) and Equalization. Containing over 1400 references and mathematical expressions Adaptive Blind Signal and Image Processing delivers an unprecedented collection of useful techniques for adaptive blind signal/image separation, extraction, decomposition and filtering of multi-variable signals and data. Offers a broad coverage of blind signal processing techniques and algorithms both from a theoretical and practical point of view Presents more than 50 simple algorithms that can be easily modified to suit the reader's specific real world problems Provides a guide to fundamental mathematics of multi-input, multi-output and multi-sensory systems Includes illustrative worked examples, computer simulations, tables, detailed graphs and conceptual models within self contained chapters to assist self study Accompanying CD-ROM features an electronic, interactive version of the book with fully coloured figures and text. C and MATLAB user-friendly software packages are also provided MATLAB is a registered trademark of The MathWorks, Inc. By providing a detailed introduction to BSP, as well as presenting new results and recent developments, this informative and inspiring work will appeal to researchers, postgraduate students, engineers and scientists working in biomedical engineering, communications, electronics, computer science, optimisations, finance, geophysics and neural networks.

Advanced Wireless Communications Discover the Applicability, Benefits, and Potential of New Technologies As advances in algorithms and computer technology have bolstered the digital signal processing capabilities of real-time sonar, radar, and non-invasive medical diagnostics systems, cutting-edge military and defense research has established conceptual similarities in these areas. Now civilian enterprises can use government innovations to facilitate optimal functionality of complex real-time systems. Advanced Signal Processing details a cost-efficient generic processing structure that exploits these commonalities to benefit commercial applications. Learn from a Renowned Defense Scientist, Researcher, and Innovator The author preserves the mathematical focus and key information from the first edition that provided invaluable coverage of topics including adaptive systems, advanced beamformers, and volume visualization methods in medicine. Integrating the best features of non-linear and conventional algorithms and explaining their application in PC-based architectures, this text contains new data on: Advances in biometrics, image segmentation, registration, and fusion techniques for 3D/4D ultrasound, CT, and MRI Fully digital 3D/ (4D: 3D+time) ultrasound system technology, computing architecture requirements, and relevant implementation issues State-of-the-art non-invasive medical procedures, non-destructive 3D tomography imaging and biometrics, and monitoring of vital signs Cardiac motion correction in multi-slice X-ray CT imaging Space-time adaptive processing and detection of targets interference-intense backgrounds comprised of clutter and jamming With its detailed explanation of adaptive, synthetic-aperture, and fusion-processing schemes with near-instantaneous convergence in 2-D and 3-D sensors (including planar, circular, cylindrical, and spherical arrays), the quality and illustration of this text's concepts and techniques will make it a favored reference.

Communications and Networking This book presents the latest theory, developments, and applications related to high resolution materials-penetrating sensor systems. An international team of expert researchers explains the problems and solutions for developing new techniques and applications. Subject areas include ultrawideband (UWB) signals propagation and scattering, materials-penetrating radar techniques for small object detection and imaging, biolocation using holographic techniques, tomography, medical applications, nondestructive testing methods, electronic warfare principles, through-the-wall radar propagation effects, and target identification through measuring the target return signal spectrum changes.

Adaptive Blind Signal and Image Processing The scope of the symposium covers all major aspects of system identification, experimental modelling, signal processing and adaptive control, ranging from theoretical, methodological and scientific developments to a large variety of (engineering) application areas. It is the intention of the organizers to promote SYSID 2003 as a meeting place where scientists and engineers from several research communities can meet to discuss issues related to these areas. Relevant topics for the symposium program include: Identification of linear and multivariable systems, identification of nonlinear systems, including neural networks, identification of hybrid and distributed systems, Identification for control, experimental modelling in process control, vibration and modal analysis, model validation, monitoring and fault detection, signal processing and communication, parameter estimation and inverse modelling, statistical analysis and uncertainty bounding, adaptive control and data-based controller tuning, learning, data mining and Bayesian approaches, sequential Monte Carlo methods, including particle filtering, applications in process control systems, motion control systems, robotics, aerospace systems, bioengineering and medical systems, physical measurement systems, automotive systems, econometrics, transportation and communication systems *Provides the latest research on System Identification *Contains contributions written by experts in the field *Part of the IFAC Proceedings Series which provides a comprehensive overview of the major topics in control engineering.

Cyclostationary Processes and Time Series Signal processing applications have burgeoned in the past decade. During the same time, signal processing techniques have matured rapidly and now include tools from many areas of mathematics, computer science, physics, and engineering. This trend will continue as many new signal processing applications are opening up in consumer products and communications systems. In particular, signal processing has been making increasingly sophisticated use of linear algebra on both theoretical and algorithmic fronts. This volume gives particular emphasis to exposing broader contexts of the signal processing problems so that the impact of algorithms and hardware can be better understood; it brings together the writings of signal processing engineers, computer engineers, and applied linear algebraists in an exchange of problems, theories, and techniques. This volume will be of interest to both applied mathematicians and engineers.

Blind Equalization in Neural Networks This volume on implementation techniques in digital signal processing systems clearly reveals the significance and power of the techniques that are available, and with further development, the essential role they will play as applied to a wide variety of areas. The authors are all to highly commended for their splendid contributors to this volume, which will provide a significant and unique international reference source for students, research workers, practicing engineers, and others for years to come.

Digital Signal Processing Handbook on CD-ROM The definitive guide to problem-solving in the design of communications systems In Algorithms for Communications Systems and their Applications, 2nd Edition, authors Benvenuto, Cherubini, and Tomasin have delivered the ultimate and practical guide to applying algorithms in communications systems. Written for researchers and professionals in the areas of digital communications, signal processing, and computer engineering, Algorithms for Communications Systems presents algorithmic and computational procedures within communications systems that overcome a wide range of problems facing system designers. New material in this fully updated edition includes: MIMO systems (Space-time block coding/Spatial multiplexing /Beamforming and interference management/Channel Estimation) OFDM and SC-FDMA (Synchronization/Resource allocation (bit and power loading)/Filtered OFDM) Improved radio channel model (Doppler and shadowing/mmWave) Polar codes (including practical decoding methods) 5G systems (New Radio architecture/initial access for mmWave/physical channels) The book retains the essential coding and signal processing theoretical and operative elements expected from a classic text, further adopting the new radio of 5G systems as a case study to create the definitive guide to modern communications systems.

Signal Prediction with Input Identification The book begins with an introduction of blind equalization theory and its application in neural networks, then discusses the algorithms in recurrent networks, fuzzy networks and other frequently-studied neural networks. Each algorithm is accompanied by derivation, modeling and simulation, making the book an essential reference for electrical engineers, computer intelligence researchers and neural scientists.

Signal Prediction with Input Identification This text seeks to clarify various contradictory claims regarding capabilities and limitations of blind equalization. It highlights basic operating

conditions and potential for malfunction. The authors also address concepts and principles of blind algorithms for single input multiple output (SIMO) systems and multi-user extensions of SIMO equalization and identification.

Advanced Ultrawideband Radar Many processes in nature arise from the interaction of periodic phenomena with random phenomena. The results are processes that are not periodic, but whose statistical functions are periodic functions of time. These processes are called cyclostationary and are an appropriate mathematical model for signals encountered in many fields including communications, radar, sonar, telemetry, acoustics, mechanics, econometrics, astronomy, and biology. Cyclostationary Processes and Time Series: Theory, Applications, and Generalizations addresses these issues and includes the following key features. Presents the foundations and developments of the second- and higher-order theory of cyclostationary signals Performs signal analysis using both the classical stochastic process approach and the functional approach for time series Provides applications in signal detection and estimation, filtering, parameter estimation, source location, modulation format classification, and biological signal characterization Includes algorithms for cyclic spectral analysis along with Matlab/Octave code Provides generalizations of the classical cyclostationary model in order to account for relative motion between transmitter and receiver and describe irregular statistical cyclicity in the data

Advanced Signal Processing A novel coding technique is presented for signal prediction with applications including speech coding, system identification, and estimation of input excitation. The approach is based on the blind equalization method for speech signal processing in conjunction with the geometric subspace projection theory to formulate the basic prediction equation. The speech-coding problem is often divided into two parts, a linear prediction model and excitation input. The parameter coefficients of the linear predictor and the input excitation are solved simultaneously and recursively by a conventional recursive least-squares algorithm. The excitation input is computed by coding all possible outcomes into a binary notebook. The coefficients of the linear predictor and excitation, and the index of the codebook can then be used to represent the signal. In addition, a variable-frame concept is proposed to block the same excitation signal in sequence in order to reduce the storage size and increase the transmission rate. The results of this work can be easily extended to the problem of disturbance identification. The basic principles are outlined in this report and differences from other existing methods are discussed. Simulations are included to demonstrate the proposed method.

CMOS Continuous-Time Adaptive Equalizers for High-Speed Serial Links This handbook plays a fundamental role in sustainable progress in speech research and development. With an accessible format and with accompanying DVD-Rom, it targets three categories of readers: graduate students, professors and active researchers in academia, and engineers in industry who need to understand or implement some specific algorithms for their speech-related products. It is a superb source of application-oriented, authoritative and comprehensive information about these technologies, this work combines the established knowledge derived from research in such fast evolving disciplines as Signal Processing and Communications, Acoustics, Computer Science and Linguistics.

A Novel Approach for Adaptive Signal Processing This book introduces readers to the design of adaptive equalization solutions integrated in standard CMOS technology for high-speed serial links. Since continuous-time equalizers offer various advantages as an alternative to discrete-time equalizers at multi-gigabit rates, this book provides a detailed description of continuous-time adaptive equalizers design - both at transistor and system levels-, their main characteristics and performances. The authors begin with a complete review and analysis of the state of the art of equalizers for wireline applications, describing why they are necessary, their types, and their main applications. Next, theoretical fundamentals of continuous-time adaptive equalizers are explored. Then, new structures are proposed to implement the different building blocks of the adaptive equalizer: line equalizer, loop-filters, power comparator, etc. The authors demonstrate the design of a complete low-power, low-voltage, high-speed, continuous-time adaptive equalizer. Finally, a cost-effective CMOS receiver which includes the proposed continuous-time adaptive equalizer is designed for 1.25 Gb/s optical communications through 50-m length, 1-mm diameter plastic optical fiber (POF).

Fourier Transform The book constitutes the refereed proceedings of the 13th EAI International Conference on Communications and Networking, held in October 2018 in Chengdu, China. The 71 papers presented were carefully selected from 114 submissions. The papers are organized in topical sections on wireless communications and networking, next generation WLAN, big data networks, cloud communications and networking, ad hoc and sensor networks, satellite and space communications and networking, optical communications and networking, information and coding theory, multimedia communications and smart networking, green communications and computing, signal processing for communications, network and information security, machine-to-machine and IoT, communication QoS, reliability and modeling, cognitive radio and networks, smart internet of things modeling, pattern recognition and image

signal processing, digital audio and video signal processing, antenna and microwave communications, radar imaging and target recognition, and video coding and image signal processing.

Unsupervised Signal Processing This book presents the basic concepts of adaptive signal processing and adaptive filtering in a concise and straightforward manner, using clear notations that facilitate actual implementation. Important algorithms are described in detailed tables which allow the reader to verify learned concepts. The book covers the family of LMS and algorithms as well as set-membership, sub-band, blind, IIR adaptive filtering, and more. The book is also supported by a web page maintained by the author.

Algorithms for Communications Systems and their Applications

Circuits and Systems for Wireless Communications

Resonance and Aspect Matched Adaptive Radar (Ramar) Signal Processing for Wireless Communication Systems brings together in one place important contributions and up-to-date research results in this fast moving area. The Contributors to this work were selected from leading researchers and practitioners in this field. The book's 18 chapters are divided into three areas: systems, Networks, and Implementation Issues; Channel Estimation and Equalization; and Multiuser Detection. The Work, originally published as Volume 30, Numbers 1-3 of the Journal of VLSI Signal Processing Systems for Signal, Image, and Video Technology, will be valuable to anyone working or researching in the field of wireless communication systems. It serves as an excellent reference, providing insight into some of the most challenging issues being examined today.

Chaotic Signals in Digital Communications The book describes a new form of radar for which the target response is frequency, i.e., resonance-dependent. The book provides both prototype designs and empirical results collected from a variety of targets. The new form of radar, called RAMAR (Resonance and Aspect Matched Adaptive Radar) advances radar OCo mere ranging and detection OCo to the level of RF spectroscopy, and permits an advance of spectroscopic methods from optical, through infra-red and into the RF spectral range. The book will describe how a target"s response can be a function of frequency components in the transmitted signal"s envelope as well as the signal"s carrier.

System Identification (SYSID '03) An authoritative guide to up-to-date research results on chaotic signal processing aimed at researchers and graduate students in chaos, applied nonlinear dynamics, signal processing and radar communications. This book examines the applications of chaotic signal processing to radar, communications, system identification and computing.

Block-oriented Nonlinear System Identification Nonlinear signal and image processing methods are fast emerging as an alternative to established linear methods for meeting the challenges of increasingly sophisticated applications. Advances in computing performance and nonlinear theory are making nonlinear techniques not only viable, but practical. This book details recent advances in nonl

Digital Signal Processing Systems: Implementation Techniques Simulation is a widely used mechanism for validating the theoretical models of networking and communication systems. Although the claims made based on simulations are considered to be reliable, how reliable they really are is best determined with real-world implementation trials. Simulation Technologies in Networking and Communications: Selecting the Best Tool for the Test addresses the spectrum of issues regarding the different mechanisms related to simulation technologies in networking and communications fields. Focusing on the practice of simulation testing instead of the theory, it presents the work of more than 50 experts from around the world. Considers superefficient Monte Carlo simulations Describes how to simulate and evaluate multicast routing algorithms Covers simulation tools for cloud computing and broadband passive optical networks Reports on recent developments in simulation tools for WSNs Examines modeling and simulation of vehicular networks The book compiles expert perspectives about the simulation of various networking and communications technologies. These experts review and evaluate popular simulation modeling tools and recommend the best tools for your specific tests. They also explain how to determine when theoretical modeling would be preferred over simulation. This book does not provide a verdict on the best suitable tool for simulation. Instead, it supplies authoritative analyses of the different kinds of networks and systems. Presenting best practices and insights from global experts, the book provides you with an understanding of what to simulate, where to simulate, whether to simulate or not, when to simulate, and how to simulate for a wide range of issues.

Signal Processing for Wireless Communication Systems Abstract: "Adaptive linear predictors have been used extensively in practice in a wide variety of forms. In the main, their theoretical development is based upon the assumption of stationarity of the signals involved, particularly with respect to the second order statistics. On this basis, the well-known normal equations can be formulated. If high-order statistical stationarity is assumed, then the equivalent normal equations involve high-order signal moments. In either case, the cross moments (second or higher) are needed. This renders the adaptive prediction procedure non-blind. A novel procedure for blind adaptive prediction has been proposed and considerable implementation has been made in our contributions in the past year. The approach is based upon a suitable interpretation of blind equalization methods that satisfy the constant modulus property and offers significant deviations from the standard prediction methods. These blind adaptive algorithms are derived by formulating Lagrange equivalents from mechanisms of constrained optimization. In this report, other new update algorithms are derived from the fundamental concepts of advanced system identification to carry out the proposed blind adaptive prediction. The results of the work can be extended to a number of control-related problems, such as disturbance identification. The basic principles are outlined in this report and differences from other existing methods are discussed. The applications implemented are speech processing, such as coding and synthesis. Simulations are included to verify the novel modelling method."

System Identification 2003 Digital Transmission – A Simulation-Aided Introduction with VisSim/Comm is a book in which basic principles of digital communication, mainly pertaining to the physical layer, are emphasized. Nevertheless, these principles can serve as the fundamentals that will help the reader to understand more advanced topics and the associated technology. In this book, each topic is addressed in two different and complementary ways: theoretically and by simulation. The theoretical approach encompasses common subjects covering principles of digital transmission, like notions of probability and stochastic processes, signals and systems, baseband and passband signaling, signal-space representation, spread spectrum, multi-carrier and ultra wideband transmission, carrier and symbol-timing recovery, information theory and error-correcting codes. The simulation approach revisits the same subjects, focusing on the capabilities of the communication system simulation software VisSim/Comm on helping the reader to fulfill the gap between the theory and its practical meaning. The presentation of the theory is made easier with the help of 357 illustrations. A total of 101 simulation files supplied in the accompanying CD support the simulation-oriented approach. A full evaluation version and a viewer-only version of VisSim/Comm are also supplied in the CD.

Efficient Receiver Methods for Coded Systems Under Channel Uncertainty A triennial summation of the state of the art in radio science This book is the fourth in the modern series of triennial reviews prepared by the International Union of Radio Science to further communication and understanding of the status and future of radio science, both for those working in the field, and for those who want to know what is of current importance in this area. The International Union of Radio Science, URSI (Union Radio-Scientifique Internationale), has divided the subject of "Radio Science" according to the ten topics of the Scientific Commissions that make up URSI. This volume consists of thirty-eight original, peer-reviewed papers. Each paper provides a critical, in-depth review of–and, in many cases, tutorial on–advances and research that have been of significant importance within the area of interest of the Commissions during the past three to four years. Among the topics covered are: Electromagnetic metrology Fields and waves Signals and systems Electronics and photonics Electromagnetic noise and interference Wave propagation and remote sensing Ionospheric radio and propagation Waves in plasmas Radio astronomy Electromagnetics in biology and medicine With an included CD-ROM of the full book text, allowing the user to do full-text searching of all the papers, the Review of Radio Science: 1999—2002 is a resource of vital importance to anyone working in, or with an interest in, radio science.

Blind Identification of Structured Dynamic Systems

Simulation Technologies in Networking and Communications Part I: RF System Integration. 1. RF System Integration; C. Toumazou. 2. RF System Board Level Integration for Mobile Phones; G.J. Aspin. 3. Integration of RF Systems on a Chip; P.J. Mole. 4. Towards the Full Integration of Wireless Front-End Circuits; M. Steyaert. 5. GSM Transceiver Front-End Circuits in 0.25 mum CMOS; Q. Huang, et al. Part II: RF Front-End Circuits. 6. RF Front-End Circuits; Q. Huang. 7. Phase-Noise-to-Carrier Ratio in LC Oscillators; Q. Huang. 8. Design Study of a 900 MHz/1.8 GHz CMOS Transceiver for Dual-Band Applications; B. Razavi. 9. Integrated Wireless Transc.

Blind Equalization and System Identification Chaotic Signals in Digital Communications combines fundamental background knowledge with state-of-the-art methods for using chaotic signals and systems in digital communications. The book builds a bridge between theoretical works and practical implementation to help researchers attain consistent performance in realistic environments. It shows the possible shortcomings of the chaos-based communication systems proposed in the literature, particularly when they are subjected to non-ideal

conditions. It also presents a toolbox of techniques for researchers working to actually implement such systems. A Combination of Tutorials and In-Depth, Cutting-Edge Research Featuring contributions by active leading researchers, the book begins with an introduction to communication theory, dynamical systems, and chaotic communications suitable for those new to the field. This lays a solid foundation for the more applied chapters that follow. A Toolbox of Techniques—Including New Ways to Tackle Channel Imperfections The book covers typical chaos communication methods, namely chaotic masking, chaotic modulation, chaotic shift key, and symbolic message bearing, as well as bidirectional communication and secure communication. It also presents novel methodologies to deal with communication channel imperfections. These tackle band-limited channel chaos communication, radio channels with fading, and the resistance of a special chaotic signal to multipath propagations. In addition, the book addresses topics related to engineering applications, such as optical communications, chaotic matched filters and circuit implementations, and microwave frequency-modulated differential chaos shift keying (FM-DCSK) systems. Insights for Both Theoretical and Experimental Researchers Combining theory and practice, this book offers a unique perspective on chaotic communication in the context of non-ideal conditions. Written for theoretical and experimental researchers, it tackles the practical issues faced in implementing chaos-based signals and systems in digital communications applications.

Digital Signal Processing Fundamentals The scope of the symposium covers all major aspects of system identification, experimental modelling, signal processing and adaptive control, ranging from theoretical, methodological and scientific developments to a large variety of (engineering) application areas. It is the intention of the organizers to promote SYSID 2003 as a meeting place where scientists and engineers from several research communities can meet to discuss issues related to these areas. Relevant topics for the symposium program include: Identification of linear and multivariable systems, identification of nonlinear systems, including neural networks, identification of hybrid and distributed systems, Identification for control, experimental modelling in process control, vibration and modal analysis, model validation, monitoring and fault detection, signal processing and communication, parameter estimation and inverse modelling, statistical analysis and uncertainty bounding, adaptive control and data-based controller tuning, learning, data mining and Bayesian approaches, sequential Monte Carlo methods, including particle filtering, applications in process control systems, motion control systems, robotics, aerospace systems, bioengineering and medical systems, physical measurement systems, automotive systems, econometrics, transportation and communication systems *Provides the latest research on System Identification *Contains contributions written by experts in the field *Part of the IFAC Proceedings Series which provides a comprehensive overview of the major topics in control engineering.

Review of Radio Science Providing key background material together with advanced topics, this self-contained book is written in an easy-to-read style and is ideal for newcomers to multicarrier systems. Early chapters provide a review of basic digital communication, starting from the equivalent discrete time channel and including a detailed review of the MMSE receiver. Later chapters then provide extensive performance analysis of OFDM and DMT systems, with discussions of many practical issues such as implementation and power spectrum considerations. Throughout, theoretical analysis is presented alongside practical design considerations, whilst the filter bank transceiver representation of OFDM and DMT systems opens up possibilities for further optimization such as minimum bit error rate, minimum transmission power, and higher spectral efficiency. With plenty of insightful real-world examples and carefully designed end-of-chapter problems this is an ideal single-semester textbook for senior undergraduate and graduate students, as well as a self-study guide for researchers and professional engineers.

Adaptive Filtering

Digital Transmission Block-oriented Nonlinear System Identification deals with an area of research that has been very active since the turn of the millennium. The book makes a pedagogical and cohesive presentation of the methods developed in that time. These include: iterative and over-parameterization techniques; stochastic and frequency approaches; support-vector-machine, subspace, and separable-least-squares methods; blind identification method; bounded-error method; and decoupling inputs approach. The identification methods are presented by authors who have either invented them or contributed significantly to their development. All the important issues e.g., input design, persistent excitation, and consistency analysis, are discussed. The practical relevance of block-oriented models is illustrated through biomedical/physiological system modelling. The book will be of major interest to all those who are concerned with nonlinear system identification whatever their activity areas. This is particularly the case for educators in electrical, mechanical, chemical and biomedical engineering and for practising engineers in process, aeronautic, aerospace, robotics and vehicles control. Block-oriented Nonlinear System Identification serves as a reference for active researchers, new comers, industrial and education practitioners and graduate students alike.

Novel Algorithms and Techniques in Telecommunications and Networking A novel coding technique is presented for signal prediction with applications including speech coding, system

identification, and estimation of input excitation. The approach is based on the blind equalization method for speech signal processing in conjunction with the geometric subspace projection theory to formulate the basic prediction equation. The speech-coding problem is often divided into two parts, a linear prediction model and excitation input. The parameter coefficients of the linear predictor and the input excitation are solved simultaneously and recursively by a conventional recursive least-squares algorithm. The excitation input is computed by coding all possible outcomes into a binary codebook. The coefficients of the linear predictor and excitation, and the index of the codebook can then be used to represent the signal. In addition, a variable-frame concept is proposed to block the same excitation signal in sequence in order to reduce the storage size and increase the transmission rate. The results of this work can be easily extended to the problem of disturbance identification. The basic principles are outlined in this report and differences from other existing methods are discussed. Simulations are included to demonstrate the proposed method.Juang, Jer-Nan and Chen, Ya-ChinLangley Research CenterSYSTEM IDENTIFICATION; SIGNAL PROCESSING; MATHEMATICAL MODELS; LINEAR PREDICTION; CODING; ALGORITHMS; VOICE DATA PROCESSING; SIMULATION

Chaotic Signal Processing Now available in a three-volume set, this updated and expanded edition of the bestselling The Digital Signal Processing Handbook continues to provide the engineering community with authoritative coverage of the fundamental and specialized aspects of information-bearing signals in digital form. Encompassing essential background material, technical details, standards, and software, the second edition reflects cutting-edge information on signal processing algorithms and protocols related to speech, audio, multimedia, and video processing technology associated with standards ranging from WiMax to MP3 audio, low-power/high-performance DSPs, color image processing, and chips on video. Drawing on the experience of leading engineers, researchers, and scholars, the three-volume set contains 29 new chapters that address multimedia and Internet technologies, tomography, radar systems, architecture, standards, and future applications in speech, acoustics, video, radar, and telecommunications. Emphasizing theoretical concepts, Digital Signal Processing Fundamentals provides comprehensive coverage of the basic foundations of DSP and includes the following parts: Signals and Systems; Signal Representation and Quantization; Fourier Transforms; Digital Filtering; Statistical Signal Processing; Adaptive Filtering; Inverse Problems and Signal Reconstruction; and Time–Frequency and Multirate Signal Processing.

Linear Algebra for Signal Processing A best-seller in its print version, this comprehensive CD-ROM reference contains unique, fully searchable coverage of all major topics in digital signal processing (DSP), establishing an invaluable, time-saving resource for the engineering community. Its unique and broad scope includes contributions from all DSP specialties, including: telecommunications, computer engineering, acoustics, seismic data analysis, DSP software and hardware, image and video processing, remote sensing, multimedia applications, medical technology, radar and sonar applications

Nonlinear Signal and Image Processing The absence of training signals from many kinds of transmission necessitates the widespread use of blind equalization and system identification. There have been many algorithms developed for these purposes, working with one- or two-dimensional signals and with single-input single-output or multiple-input multiple-output, real or complex systems. It is now time for a unified treatment of this subject, pointing out the common characteristics of these algorithms as well as learning from their different perspectives. "Blind Equalization and System Identification" provides such a unified treatment presenting theory, performance analysis, simulation, implementation and applications. This is a textbook for graduate courses in discrete-time random processes, statistical signal processing, and blind equalization and system identification. It contains material which will also interest researchers and engineers working in digital communications, source separation, speech processing, and other, similar applications.

Blind System Identification and Blind Equalization Using Higher-order Cumulants The field of signal processing has seen explosive growth during the past decades; almost all textbooks on signal processing have a section devoted to the Fourier transform theory. For this reason, this book focuses on the Fourier transform applications in signal processing techniques. The book chapters are related to DFT, FFT, OFDM, estimation techniques and the image processing techqniques. It is hoped that this book will provide the background, references and the incentive to encourage further research and results in this area as well as provide tools for practical applications. It provides an applications-oriented to signal processing written primarily for electrical engineers, communication engineers, signal processing engineers, mathematicians and graduate students will also find it useful as a reference for their research activities.

Blind Equalization and Identification The wireless community is on the verge of the standardization of fourth generation (4G) systems. Research has generated a number of solutions for significant improvement of system performance. The development of enabling technologies such as adaptive coding and modulation, iterative (turbo) decoding algorithms and space-time coding, means that industry can now implement these solutions. Advanced Wireless Communications: 4G Technologies focuses on the system elements that provide adaptability and reconfigurability and discusses how these features can improve 4G system performance. There are several different systems comprising 4G, including adaptive WCDMA (Wideband Code

Division Multiple Access), ATDMA (Adaptive Time Division Multiple Access), Multicarrier (OFDMA) and Ultra Wide Band (UWB) receiver elements. This book provides a comparative study of these technologies and focuses on their future co-existence. Topics covered include: Space Time Coding, including discussions on diversity gain, the encoding and transmission sequence, the combining s cheme and ML decision rule for two-branch transmit diversity scheme with one and M receivers. Ultra Wide Band Radio, UWB multiple access in Gaussian channels, the UWB channel, UWB system with M-ary modulation, M-ary PPM UWB multiple access, coded UWB schemes, multi-user detection in UWB radio, UWB with space time processing and beam forming for UWB radio. Antenna array signal processing with focus on Space-Time receivers for CDMA communications, MUSIC and ESPRIT DOA estimation, joint array combining and MLSE receivers, joint combiner and channel response estimation and complexity reduction in the wide-band beam forming Channel modeling and measurement, adaptive MAC, adaptive routing and TCP layer are also addressed. This book will supply the reader with a comprehensive understanding of the relationship between the systems performance, its complexity/reliability and cost-effectiveness. It gives an insight into the impact of existing and new technologies on the receiver structure and provides an understanding of current approaches and evolving directions for personal and indoor communication.

Filter Bank Transceivers for OFDM and DMT Systems Novel Algorithms and Techniques in Telecommunications and Networking includes a set of rigorously reviewed world-class manuscripts addressing and detailing state-of-the-art research projects in the areas of Industrial Electronics, Technology and Automation, Telecommunications and Networking. Novel Algorithms and Techniques in Telecommunications and Networking includes selected papers form the conference proceedings of the International Conference on Telecommunications and Networking (TeNe 08) which was part of the International Joint Conferences on Computer, Information and Systems Sciences and Engineering (CISSE 2008).

Techniques for Blind System Identification and Application to the Equalization of PAM/QAM Modulated Signals Unsupervised Signal Processing: Channel Equalization and Source Separation provides a unified, systematic, and synthetic presentation of the theory of unsupervised signal processing. Always maintaining the focus on a signal processing-oriented approach, this book describes how the subject has evolved and assumed a wider scope that covers several topics, from well-established blind equalization and source separation methods to novel approaches based on machine learning and bio-inspired algorithms. From the foundations of statistical and adaptive signal processing, the authors explore and elaborate on emerging tools, such as machine learning-based solutions and bio-inspired methods. With a fresh take on this exciting area of study, this book: Provides a solid background on the statistical characterization of signals and systems and on linear filtering theory Emphasizes the link between supervised and unsupervised processing from the perspective of linear prediction and constrained filtering theory Addresses key issues concerning equilibrium solutions and equivalence relationships in the context of unsupervised equalization criteria Provides a systematic presentation of source separation and independent component analysis Discusses some instigating connections between the filtering problem and computational intelligence approaches. Building on more than a decade of the authors' work at DSPCom laboratory, this book applies a fresh conceptual treatment and mathematical formalism to important existing topics. The result is perhaps the first unified presentation of unsupervised signal processing techniques—one that addresses areas including digital filters, adaptive methods, and statistical signal processing. With its remarkable synthesis of the field, this book provides a new vision to stimulate progress and contribute to the advent of more useful, efficient, and friendly intelligent systems.

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